Math 645.600  
Survey of Mathematical Problems I  
Course Information

Course Description and Prerequisites

This course is required for the MS teaching option but is designed to also be a transition course and a general survey course for beginning MS students, as well as a course for current and prospective teachers of mathematics.

This semester we will emphasize topics from finite and discrete mathematics, such as logic, probability, graph theory, number theory, algebra, and geometry. A continuation course next semester will concentrate more on topics from continuous mathematics (calculus, differential equations, etc.).

The goals of this course are for you:
- to increase your mathematical knowledge and skills;
- to be exposed to the breadth of mathematics and to many of its interesting problems and applications;
- to know how to have fun with mathematics;
- to see the unity of diverse mathematical fields;
- to work creatively;
- to increase your competence with open-ended questions, with questions whose answers are not known, and with ill-posed questions;
- to know how to read and understand mathematics; and
- to know that, when students ask you a question, you will either know an answer or know where to tell them to look for an answer.

It is hoped that after completing this course, you will have an expanded perspective and enthusiasm for mathematics that you can convey to your own students in the future.

Prerequisites: A basic knowledge of linear algebra, modern algebra, and advanced calculus at the level of Math 222, Math 415, and Math 409 respectively.

Text

Class notes will be provided. Austin students should contact the instructor regarding obtaining the class notes.
The readings may be purchased at Copy Corner, 1404 Texas Ave. South, College Station, TX 77840 (near the corner of George Bush Drive and Texas Avenue). Austin students should email Copy Corner c/o Ms. Vicki Ward at classnotes@copy-corner.com for instructions regarding purchasing your copy.

**Instructor and Class Information**
Jon Pitts
Office: 8th Floor Rudder and MILN 312
Email: j-pitts@tamu.edu
URL: http://www.math.tamu.edu/~jon.pitts/
Class meets T 6:00 p.m.–9:00 in WERC 049.
Office hours are TR 8:15–10:00 and by appointment.
Students with disabilities can get assistance from the Office of Services for Students with Disabilities (845-1637).

**Basis for Grading**
There will be homework, a project, class participation, peer evaluation, and possibly quizzes. Semester scores will be determined on the following basis:

- A – Did most of the work well.
- B – Did most of the work reasonably.
- C – Did minimal work.
- F – Failed to complete a substantial amount of the required work.

In lieu of a final examination during exam week, there will be a class meeting on 6-9 p.m., Tuesday, December 4, even though that Tuesday is officially a Friday.

**Homework**
There will be a variety of types of homework: solving typical mathematical problems, reading, inventing problems yourself, doing projects, etc. Please read the selections in the course packet carefully and try to understand the details, including the proofs.

You are encouraged to work together on homework; during class meetings, we will have formal working groups. Not only will each of you learn more by working together, but it will be more fun. However, you must each write up your own homework solutions individually.

**Absences and late work**
In-class activities are an integral part of this course, and since the course meets only once a week, you will miss a significant part of the material if you are absent. If an emergency forces you to miss a class meeting, please notify the instructor in advance if possible.

You are expected to come to class prepared and to turn in all assignments on time. If extraordinary circumstances arise that will preempt your work on this course, please make arrangements with the instructor in advance.
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Benchmarks and Assignments

Tentative Schedule of Major Benchmarks

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>September 4, 2001</td>
<td>Pick your project paradox</td>
</tr>
<tr>
<td>October 23, 2001</td>
<td>Rough draft of project due</td>
</tr>
<tr>
<td>November 13, 2001</td>
<td>Last day for final draft of project</td>
</tr>
<tr>
<td>November 27, 2001</td>
<td>Classroom presentations (subject to class size)</td>
</tr>
<tr>
<td>December 4, 2001</td>
<td>Classroom presentations</td>
</tr>
</tbody>
</table>

Problems

Write your answers carefully and completely. Presentation is important!

Due 09/04: Chapter 1 TBA